



Federal Communications Commission
Office of Engineering and Technology
Laboratory Division

July 2, 2021

PRE-APPROVAL GUIDANCE LIST

1. INTRODUCTION

In establishing the requirements for the Telecommunications Certification Body (TCB) program, the Commission stated that while it intended to allow TCBs to certify a broad range of equipment, certain functions should continue to be performed by the Commission.

To certify certain types of equipment for which the Commission has not yet established specific guidelines, where a new technology or new rule part is integral, where there is an obligation by the Commission to approve an authorization, or where there is a need to provide case-by-case guidance, the Commission has adopted the Pre-Approval Guidance (PAG) procedure described in KDB Publication 388624 D01.

In general, a TCB needs to follow the PAG procedure when the required test procedures, test equipment, or requirements necessary to configure, support or test a device have not been established.¹ This may be the case in the following circumstances:

- the available test procedures do not readily support the modulation or radio parameters of a device, such as for multiple transmissions or wideband waveforms;
- the required test procedures need modification for testing a device;
- an alternative measurement procedure is proposed.

This document provides guidance indicating which types of devices are subject to PAG requirements. There are three classes of applications for equipment authorization subject to a PAG review, prior to approval by a TCB:

- Devices subject to special conditions where the authorization procedures to be used must be approved by the FCC
- Devices for which a sample must be submitted to the FCC for pre-approval testing²
- Devices for which there are operation or installation issues which are subject to FCC review

In each class there are several items, with a unique six-character code identifier that mnemonically relates to the topic of each specific item in the PAG list.

¹ Specified items on the PAG list may be approved using the PAG Reuse procedures outlined in KDB Publication 388624 D01 when applicable. PAG list items authorized to use the PAG Reuse procedures include DFS, HAC, and dynamic antenna tuning related applications.

² Test samples are not to be submitted until requested via the FCC Equipment Authorization System (EAS). For any individual application, the FCC may waive sample submittal at its discretion.

2. DEVICES REQUIRING APPROVAL FOR AUTHORIZATION PROCEDURES

RFXLIM

RF exposure limits are not fully established, or when the FCC has determined that Sections 1.1307 (c) or (d) applies.

MOBPOR

When Section 2.1091(d)(4) of the FCC rules applies and SAR or MPE (above 6 GHz) evaluation is required, except when related to a C2PC in U-NII Bands 5.925-7.125 GHz for an already certified module addressing RF exposure conditions for a specific host(s).

NUMSIM

RF exposure evaluations using numerical simulations or computational modeling techniques.

POR100

Transmitters operating at frequencies below 100 MHz for which SAR evaluation is required per KDB Publication 447498.

OVER6G

Portable transmitters operating at frequencies above 6 GHz for which routine RF exposure evaluation is required. An exception for this PAG submittal requirement may be granted via KDB inquiry when for each band SAR is limited to 0.8 W/Kg, and the SAR total algebraic summation from transmitters that can be active at the same time is limited to 1.45 W/kg.

SAREXC

Portable transmitters operating with source-based, time-averaged maximum output power according to wireless network or infrastructure requirements and separation distance requirements exceeding the “SAR Exclusion Threshold” in KDB Publication 447498 by either: (a) 8 times or more, for compliance with general population exposure requirements; or (b) 20 times or more, for compliance with occupational exposure requirements.

NOTSAR

When procedures for SAR evaluation are not covered in KDB Pub. 447498 and other KDB publications referenced therein, or if the SAR data required to support compliance is not provided.

PWRDIN

Mobile and portable devices incorporating mechanisms to actively control the output power, transmission intervals, transmission durations, transmission duty factors or other relevant parameters in a dynamic or non-systematic manner to mitigate the potential of RF exposure according to time-averaging considerations to determine RF exposure compliance.

3. DEVICES REQUIRING A SAMPLE FOR PRE-APPROVAL TESTING³

UNIDFS

Unlicensed National Information Infrastructure (U-NII) devices with Dynamic Frequency Selection (DFS) capability (Part 15, Subpart E), including client devices operating in the DFS bands that have radar detection capability.

4. DEVICES WITH OPERATION OR INSTALLATION ISSUES

4.1 RF Exposure Evaluation

SIMULT

When simultaneous transmission SAR measurement is required (see enlarged zoom scan measurement and volume scan post-processing in KDB Publication 865664 D01). Regardless of SAR test exclusion or measurement requirements, when the simultaneously transmitted signals are coherent.⁴

FACTOR

When KDB Pub. 447498 and other KDB publications referenced therein do not establishing procedures that readily support the form factor, design or implementation of a product or exposure condition, or when non-standard phantom configurations or test procedures are used for SAR testing.

PHANTM

Devices requiring, or tested with, a phantom or test configurations that are not specified in KDB Pub. 447498 and other KDB publications referenced therein. For example, when a flat phantom is not used for testing extremity SAR in hands, wrists, feet or ankles or when the SAM phantom or other specific phantoms (described in IEEE/IEC SAR measurement standards) is used for testing other exposure conditions, such as wrist-worn, head-worn devices or other use conditions that may require field reconstruction techniques or non-standard post-processing procedures to determine the 1-g SAR.

OCCPTT

When SAR test reduction is applied not in accordance with KDB Publication 643646 to occupational handheld push-to-talk (PTT) radios, or when KDB Publication 643646 is applied and the highest reported SAR is > 6.0 W/kg.

UPMIMO

When KDB Pub. 662911, KDB Pub. 447498 and other publications referenced therein, do not provide procedures applicable for testing uplink MIMO or antenna diversity transmit configurations, including all 3G/4G/5G technologies.

ANTTUN

When dynamic antenna tuning is applied to optimize transmission efficiency for wide range frequency operations or other operating requirements.⁵

³ Test samples are not to be submitted until requested via the FCC Equipment Authorization System (EAS). For any individual application, the FCC may waive sample submittal at its discretion.

⁴ See KDB Publication 865664 D01 and KDB Publication 447498 D01 for additional information on coherent signal conditions.

⁵ A PAG is not required, provided it is fully explained in the SAR report, when the antenna tuning and operating parameters are implemented using a fixed table look-up mechanism that is fully contained within the approved transmitter; therefore, antenna tuning is static and remains unchanged for the same device operating configurations. The same set of parameters and components must be active for each condition regardless of when and how the device is used. When antenna tuning conditions may change for the same operating

PWRRED

When a power reduction feature is used to reduce the transmit power; except: when the power reduction is implemented using a single fixed level of reduction through static table look-up for all exposure test configurations in a single wireless operating mode of a frequency band and it is triggered by a single event or operation; or when simultaneous transmission requires power reduction and it is not implemented for satisfying SAR compliance requirements, where simultaneous transmission SAR test exclusion is applied according to the reported standalone SAR tested at the maximum output power level without any power reduction.

PWRINC

When power increase feature is applied to selectively boost the maximum conducted output power in specific wireless modes, or operating configurations without exceeding the maximum output (*e.g.*, radiated output, allowed by the equipment certification).

TXSENS

When proximity, device tilt, movement detection or other sensing features are used to reduce the transmit power; additional guidance shall be followed for specific implementations⁶ and for testing (KDB Publication 616217)⁷.

LODUTY

When a low duty factor analysis report is required to qualify for SAR test exclusion or reduction without a prior KDB inquiry confirming acceptance of the analysis.

AGGREG

Mobile and portable devices designed to transmit simultaneously using multiple channels in single or multiple frequency bands or transmit using “carrier aggregation techniques” for contiguous or non-contiguous channels. For devices using these techniques in accordance with KDB Publication 248227 the PAG requirement is waived⁸.

SARWID

Technologies operating with wide channel bandwidths or transmission bands where the SAR probe calibration and tissue-equivalent dielectric medium may not fully support such wide band measurements, or when specific procedures in KDB Publication 248227 are not applicable⁹.

conditions and exposure conditions, a PAG is required to determine SAR test requirements according to the individual implementations.

⁶ Applications must implement the Hall Effect and Gravity Sensor Guidance from slide 10 in the RF Exposure Procedures Presentation from the November 2019 TCB Workshop in determining lid angle where power reduction triggering occurs.

⁷ When the antenna and sensor are near the corner of a tablet or similar devices, a KDB inquiry is necessary to determine if additional SAR tests are required.

⁸ When this PAG requirement waiver is invoked, the issues related to estimating MPE compliance for multiple carrier simultaneous transmission shall be fully addressed in a KDB inquiry.

⁹ See KDB Publication 865664 D01 for SAR probe calibration and tissue dielectric parameter requirements.

SARRAY

When sensor-array and vector measurement-based SAR systems are used for testing wireless technologies, products, exposure configurations.

WPTAPP

Wireless power transfer (WPT) applications, except for those applications that meet the established criteria in KDB Publication 680106 D01.

4.2 EMC and Transmission Radio Parameters**DRGAIN**

Where directional gain of antenna systems is measured in lieu of calculations. Directional antenna gain measurement procedure and measurement test results should be provided as described in publication 662911 D03.

4.3 Administrative Issues**CONFID**

Requests for permanent confidentiality under exceptional circumstances for exhibits that are not typically held confidential. Requests for keeping external photos, or other exhibits which are normally not eligible for “Long Term Confidentiality” as noted in KDB Publication 726920 D03, require a submission of PAG.¹⁰

SOFTDR

Devices requesting approval or Class III permissive change for Software Defined Radio (SDR) subject to Section 2.944 (KDB Publication 442812).¹¹

SWC2PC

Class II permissive changes for devices that have not been approved as Software Defined Radio (SDR), but the grantee intends either under their control or to authorize certain approved third parties to change the circumstances under which the transmitter operates by distribution of the software to field deployed devices (KDB Publications 178919 and 594280).¹²

TXSPLT

Split modular transmitters authorized under Section 15.212 (KDB Publication 996369).

ENFORC

Devices restricted to use by only State, Local, or Federal law enforcement agencies.

¹⁰ As discussed in KDB Publication 726920, if a non-disclosure agreement (NDA) or some similar arrangements are required between the user and the grantee, and a sample NDA is included in the application, such applications are not subject to PAG.

¹¹ Certain devices may be approved under the PAG reuse procedure if the software implementation is identical to the previously approved device.

¹² Certain devices may be approved under the PAG Reuse procedure if the software control mechanisms are identical to previously approved PAG for the same Grantee.

WAIVER

Grants issued under an FCC Waiver. TCB's procedures are: (1) the 731 form associated waiver questions must be checked yes; (2) support information must be uploaded; (3) the waiver must be submitted as part of the filing in the cover letter or attestation exhibit type; (4) a letter from the grantee indicating how the waiver is applicable and indicating that the waiver conditions are met; (5) enter grant comments on form 731 that identifies the waiver by the waiver order and operational restrictions; (6) manuals must include information on the waiver conditions.

4.4 Rule Part-specific Devices

SLOWRA

Transmitters operating under the special provisions of spectral efficiency specified in Section 90.203(j)(8) for slower data rate where case-by-case consideration is necessary (KDB Publication 579009).

MEDIMP

Implanted transmitters with maximum total available output power > 1.0 mW, except Part 95 *MedRadio*.

MEDRAD

MedRadio transmitters designed to operate in 413-419 MHz, 426-432 MHz, 438-444 MHz, 451-457 MHz, and 2360-2400 MHz bands (Part 95 Subpart I).

UWB15F

Ultra-wideband devices operating under Part 15 Subpart F.

UMFLEX

Devices certified under Part 30 Upper Microwave Flexible Use Service.

UN6GHZ

U-NII devices authorized in U-NII Bands 5.925-7.125 GHz under guidance of KDB Publication 987594, except for the C2PC case specified in RF exposure, item code MOBPOR of this document.

UN5GHZ

U-NII devices authorized in UNII 4 Band 5.850-5.895 GHz and channels that span UNII-3 and UNII 4 Bands under Part 15 Subpart E—Unlicensed National Information Infrastructure Devices.

RDR255

Field disturbance sensors¹³ and/or Radars under 15.255. The Operational Description exhibit submitted with the Equipment Authorization application shall include a detailed explanation of how the fixed operation requirement of §15.255(a)(2) is satisfied. If certification is being requested for non-fixed operation as a Short-Range Interactive Motion Sensor (SRIMS), then a comprehensive justification shall be provided in the Operational Description exhibit.

WSD15H

White Space Devices (WSD) operating under Part 15 Subpart H.

¹³ § 15.255(a) Operation under the provisions of this section [§ 15.255] is not permitted for (2) Field disturbance sensors, including vehicle radar systems, unless the field disturbance sensors are employed for fixed operation, or used as short-range devices for interactive motion sensing. For the purposes of this section, [§ 15.255] the reference to fixed operation includes field disturbance sensors installed in fixed equipment, even if the sensor itself moves within the equipment. For field disturbance sensors, TCBs are encouraged to submit Inquires to be evaluate prior to submitting a PAG.

4.5 Hearing Aid Compatible (HAC) mobile handsets subject to Section 20.19

HAC5GS

Demonstrating T-coil compliance when interim procedures as defined in KDB Publication 285076 D03 HAC FAQ Question 9 are used for testing VoLTE calls for 5G Sub 6 bands when call boxes do not support 5G calling.

5. PAG REUSE LIST

The following items from the PAG list (Section II of this document) may be approved using the PAG Reuse procedures outlined in KDB Publication 388624 D01; PAG Reuse is allowed only for the following PAG list items:

- **UNIDFS:** DFS reuse will be allowed only if the device has the same DFS sensing hardware and software of a previously approved DFS PAG.
- **HAC5GS:** HAC PAG list of Section 4.5. For reuse approval, use a PAG formatted in accordance with KDB Publication 285076 D03 HAC FAQ Question 9.
- **ANTTUN:** Dynamic Antenna Tuning.
- **TXSENS** Reuse is permitted only for Power reduction for convertible laptops utilizing Hall effect or G-sensors, under PAG item TXSENS¹⁴.

CHANGE NOTICE

06/26/2015: 388624 D02 Pre-Approval Guidance List v16 replaces 388624 D02 Permit but Ask List v15r03. The document has been revised to address the changes to the new Pre-Approval Guidance procedure established in Report and Order FCC 14-208. Added new items for Citizens Broadband Radio Service, LTE-U and massive MIMO.

10/16/2015: 388624 D02 Pre-Approval Guidance List v16r01 replaces 388624 D02 Permit but Ask List v16. Clarified II.C.2.a. to better align with II.C.1.o.

04/08/2016: 388624 D02 Pre-Approval Guidance List v16r02 replaces 388624 D02 Pre-Approval Guidance List v16r01. Removed requirements to submit PAG samples for UWB devices; clarified EMC simultaneous transmission requirements; clarified confidentiality issues; removed VoLTE HAC but kept VoWiFi; removed signal boosters; removed UNII-1 and Wi-Fi client peer-peer applications.

04/09/2018: 388624 D02 Pre-Approval Guidance List v16r03 replaces 388624 D02 Pre-Approval Guidance List v16r02. Removed requirements to submit PAG for LTE-U and LAA devices. Added new item for Part 30 devices. Clarification on when inquiry is needed for WPT devices.

09/28/2018: 388624 D02 Pre-Approval Guidance List v16r04 replaces 388624 D02 Pre-Approval Guidance List v16r03. Changes to requirement to submit PAG for White Space Device (WSD) and some technologies under the RF Exposure list.

¹⁴Reuse is only applicable for convertible laptops whose screen rotates around 1 axis, from 0 to 360 degrees, in a clamshell style, from closed mode, to open mode, to tent mode, and finally to tablet mode. Actual screen lid angles where power reduction triggering occurs, and amount of power reduction may differ in later applications but the same sensor mechanism hardware as the original PAG must be used.

04/25/2019: 388624 D02 Pre-Approval Guidance List v16r05 replaces 388624 D02 Pre-Approval Guidance List v16r04. Added reference to the use of PAG reuse procedures for certain applications.

04/06/2020: 388624 D02 Pre-Approval Guidance List v16r06 replaces 388624 D02 Pre-Approval Guidance List v16r05. Added clarification to the list of items for reuse.

07/29/2020 388624 D02 Pre-Approval Guidance List v16r07 replaces 388624 D02 Pre-Approval Guidance List v16r06. Added to the PAG list item 2. Other Conditions f (ii) for HAC testing 5G sub 6 GHz. Update Reuse List (b) SDR reuse. SDR, PAG item C 2 is removed from PAG reuse procedure due to a EAS system design that automatically sets the application to a PAG status.

08/14/2020 388624 D02 Pre-Approval Guidance List v16r08 replaces 388624 D02 Pre-Approval Guidance List v16r07. Added to the PAG: U-NII Devices authorized in U-NII Bands 5.925-7.125 GHz under guidance of KDB Publication 987594.

08/28/2020 388624 D02 Pre-Approval Guidance List v16r09 replaces 388624 D02 Pre-Approval Guidance List v16r08. Corrected section III. PAG REUSE LIST subsection B to include Question 9 from KDB Publication 285076 D03 HAC FAQ.

10/13/2020 388624 D02 Pre-Approval Guidance List v16r10 replaces 388624 D02 Pre-Approval Guidance List v16r09. (ii) added Pag item when directional gain of antenna systems is measured in lieu of calculations section 2. Other Conditions (a) (ii).

02/11/2021 388624 D02 Pre-Approval Guidance List v16r11 replaces 388624 D02 Pre-Approval Guidance List v16r10. Added PAG item C 2. o: Field disturbance sensors.

03/19/2021 388624 D02 Pre-Approval Guidance List v16r12 replaces 388624 D02 Pre-Approval Guidance List v16r11. Items in section II A 2 and C 2 n added an exception for a PAG for U-NII Bands 5.925-7.125 GHz.

04/20/2021 388624 D02 Pre-Approval Guidance List v17 replaces 388624 D02 Pre-Approval Guidance List v16r12. Added identification of PAG items using a 6-digit item Identifier, Clarification on 15.255 (RDR255), Clarification in 6GHz (MOBPOR) for exception to C2PC for RF exposure, added new PAG reuse item TXSENS, and added a PAG item WAIVER. Removed from (v16r12) the PAG list II C II C 2 a (i): Using massive MIMO techniques, II C 2 m: White Space Devices and II C 2 f (i): OTT HAC.

04/28/2021: 388624 D02 Pre-Approval Guidance List v17r01 replaces 388624 D02 Pre-Approval Guidance List V17 for corrections. II C 2 m: White Space Devices was incorrectly removed from the PAG list and is now added back as WSD15H. Also, correction made to 5.PAG REUSE LIST, HAC5GS reference to KDB Publication 285076 D03 HAC FAQ Question 8 reference was removed since 285076 D03 HAC FAQ Question 8 is no longer a PAG.

06/16/2021: 388624 D02 Pre-Approval Guidance List v17r02 replaces 388624 D02 Pre-Approval Guidance List v17r01 for corrections. Code ANTTUN is the correct one for the antenna tuning item in the reuse list, it replaces the incorrect cross reference to UPMIMO. Removed extraneous wording in OVER6G item. Removed the SARTDD item. Reworded TXSENS, Note 6, Note 7, AGGREG, and Note 8, SARRAY and removed former Note 10. Introduced specific cross-references to KDB publications also in SARWID, NOTSAR, FACTOR, PHANTM, and UPMIMO.

07/02/2021: 388624 D02 Pre-Approval Guidance List v17r03 replaces 388624 D02 Pre-Approval Guidance List v17r02 to add item UN5GHZ to the PAG list.